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Original Article

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Communication and empathy within the patient-physician relationship among patients with and without chronic pain

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Abstract

Context: Chronic pain may affect the relationship between patients and their treating physicians.
Objectives: This study was designed to compare four aspects of physician communication and physician empathy reported by patients with chronic pain and in chronic pain-free controls.
Methods: A cross-sectional study was conducted within a national pain research registry from July 2020 through January 2024. Patients with chronic low back pain of greater than 3 months duration were matched to chronic pain-free controls utilizing propensity scores derived from a logistic regression model based on 11 variables that included sociodemographic characteristics, cigarette smoking status, history of comorbid medical conditions, and duration of the current patient-physician relationship. Patients reported on the primary outcomes of physician communication utilizing the Communication Behavior Questionnaire (CBQ) and physician empathy utilizing the Consultation and Relational Empathy (CARE) measure. Group means were compared for each aspect of physician communication (patient participation and patient orientation, effective and open communication, emotionally supportive communication, and communication about personal circumstances) and physician empathy, and Cohen's d statistic was utilized to assess the clinical relevance of between-group differences. Secondary exploratory analyses were also performed to compare patients treated by osteopathic physicians vs. allopathic physicians and to determine whether study group X physician type interaction effects were present.
Results: The 387 patients in each study group were matched within a caliper width of 0.001 on the propensity score. Overall, patients ranged from 21 to 79 years of age (mean, 50.7 years; standard deviation [SD], 15.1 years), and 617 (79.7 %) of them were female. Patients in the chronic pain group reported poorer scores for all aspects of physician communication and physician empathy than the chronic pain-free controls. All between-group differences were clinically relevant. There were no differences in physician communication or physician empathy according to physician type in the exploratory analyses, and study group X physician type interaction effects were not observed.
Conclusions: In this cross-sectional study, patients with chronic pain reported having physicians with poorer communication and less empathy than chronic pain-free controls. Longitudinal research is needed to more clearly determine the temporal relationship between patients' chronic pain and physician communication and physician empathy during medical encounters.

Over 50 million adults in the United States experience chronic pain, including 17 million with substantial restrictions in daily activities [1]. Physician communication and physician empathy are important aspects of patient-centered care that are critical to building satisfying and enduring patient-physician relationships for chronic pain management. In addition to improvements in pain and function, patients strongly desire explanations for their symptoms [2]. However, patients with chronic pain often feel misunderstood or marginalized when there are no objective findings to explain their pain, and physicians may adopt an attitude of mistrust when symptoms and diagnostic evidence are incongruent [3]. Nevertheless, there is evidence that physicians can be trained in communication [4], which may increase the likelihood of favorable outcomes in patients with chronic pain [5]. Although medical communication

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fundamentally involves the triad of message, social context of the patient, and physician, empathic messaging enhances its effectiveness [6]. Greater physician empathy is associated with better longitudinal outcomes pertaining to pain, function, and health-related quality of life among patients with chronic pain [7].

Despite challenges involving the patient-physician relationship in chronic pain management, there is little comparative data pertaining to the patient-physician relationship among chronic pain-free patients. Thus, we conducted this study to better understand how chronic pain impacts the patient-physician relationship, particularly in regard to physician communication and physician empathy.

Methods

Study design and patients

Patients for this study were selected from the Pain Registry for Epidemiological, Clinical, and Interventional Studies and Innovation (PRECISION) or from its affiliated control panel from July 2020 through January 2024. The inclusion criteria specified that patients be aged 21–79 years at enrollment, reside in the 48 contiguous United States or the District of Columbia, and have a designated physician for treatment of chronic low back pain (chronic pain group) or for general medical care (control group). Exclusion criteria were being pregnant, residing in an institutional facility, or not having sufficient English language proficiency to complete case report forms independently or with registry staff assistance. The chronic pain group included patients currently reporting chronic low back pain of at least 3 months duration, whereas the control group was comprised of patients who never experienced chronic low back pain and did not currently report chronic pain in any bodily region. Registry and control panel data, including race and ethnicity, were self-reported by patients at enrollment utilizing a digital research platform for electronic data capture. This research was approved by the North Texas Regional Institutional Review Board (protocol 2015-169), and all study participants provided written informed consent. Detailed information about PRECISION is available at ClinicalTrials.gov [8].

Medical treatment providers

Patients classified their designated physician at enrollment as either a “DO (osteopathic doctor)” or “MD (medical doctor).” The registry considers only these physicians as medical treatment providers, consistent with the National Ambulatory Medical Care Survey design [9]. It does not collect data on other providers who may offer chronic pain treatment (e.g., chiropractors, physical therapists, or other manual therapy providers) or other forms of general healthcare (e.g., alternative medicine practitioners).

Measures of physician communication and physician empathy

Registry and control panel patients provided measures of physician communication and physician empathy at enrollment utilizing two validated research instruments. The Communication Behavior Questionnaire (CBQ) was initially developed and validated as a measure of patient preferences regarding physician communication pertaining to chronic illness (i.e., low back pain or ischemic heart disease) [10]. The CBQ consists of 23 items that represent four distinct scales, including patient participation and patient orientation, effective and open communication, emotionally supportive communication, and communication about personal circumstances [11]. Scores potentially range from 0 to 100 on each scale and Cronbach’s alpha for these scales ranges from 0.88 to 0.92. The Consultation and Relational Empathy (CARE) measure was developed and validated as a process measure of empathy during physician encounters for primary care [12]. It consists of 10 items, with scores potentially ranging from 10 to 50. Cronbach’s alpha for the measure is 0.93. It is applicable to virtually all clinical encounters and is not influenced by the patient’s chief complaint, socioeconomic status, chronicity of disease, or emotional state [13]. Higher scores represent more favorable patient perceptions of physician communication on the CBQ and of physician empathy on the CARE measure.

Statistical analysis

The chronic pain and control groups were matched utilizing propensity scores derived from a logistic regression model that included age, sex, race, ethnicity, educational level, cigarette smoking status, diagnosis of medical comorbidities (hypertension, heart disease, diabetes mellitus, and asthma), and duration of the patient-physician relationship (less than 1 year, 1–5 years, or greater than 5 years). Patients were matched within a caliper width of 0.001. Descriptive statistics were utilized to test the adequacy of matching by comparing the chronic pain and control groups, utilizing the chi-square test for dichotomous or categorical variables and the t-test for continuous variables. These comparisons also included an assessment of standardized differences to

determine if any exceeded the threshold of 0.1 for non-negligible differences between groups [14]. Group differences on each of the CBQ scale scores and the CARE measure were assessed with the t-test. The magnitude of Cohen's d statistic was utilized to identify and classify clinically relevant results (d<0.2, not clinically relevant; 0.2≤d<0.5, small effect; 0.5≤d<0.8, medium effect; d≥0.8, large effect) [15]. Utilizing OpenEpi [16], our sample size was shown to have at least 80 % statistical power to detect small, but clinically relevant, differences between groups pertaining to each physician communication scale and physician empathy. Generalized linear models were also utilized to explore the effects of physician type (osteopathic vs. allopathic physician) on reported scores for physician communication and physician empathy by including a group X physician type interaction term to the model in addition to assessing main effects of the group and physician type. However, because the sample size was not sufficiently large to detect a small, but clinically relevant, main effect for physician type nor to detect a significant group X physician type interaction effect [17], this should be considered a secondary exploratory aspect of the study. Data management and analyses were performed utilizing the IBM SPSS Statistics (Version 29) software. Hypotheses were tested at the alpha level of 0.05 utilizing two-sided tests.

Results

Group characteristics

A total of 1,339 eligible patients, including 752 patients with chronic pain and 587 chronic pain-free patients, were identified through PRECISION during the study period. Propensity-score matching yielded 387 patients in each group (Table 1). The mean propensity score (standard deviation [SD]) in each group was 0.531 (0.145). Overall, patients ranged from 21 to 79 years of age and their mean (SD) age was 50.7 (15.1) years. There were no significant differences between groups on matched variables, and no standardized differences exceeded the 0.1 threshold for non-negligible group differences.

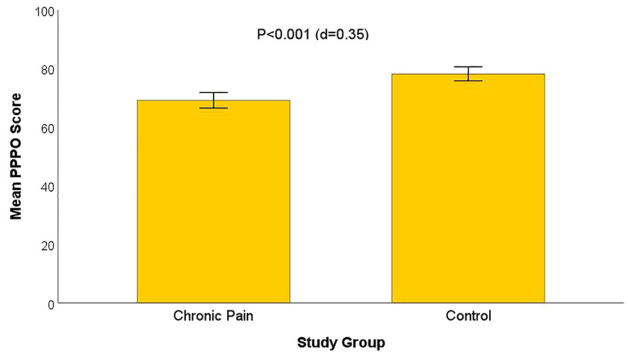
Table 1: Demographic and health characteristics of propensity-score matched cases and controls.

Characteristic	Cases (n=387)	Controls (n=387)	Sdiff (Cohen's d)	p-Value
Age: 21–49 years	171	175	0.06	0.50
Age: 50–64 years	126	135		
Age: 65–79 years	90	77		
Sex: female	314	303	0.07	0.33
Sex: male	73	84		
Race: non-White[a]	52	62	0.07	0.31
Race: White	335	325		
Ethnicity: Hispanic	24	27	0.03	0.66
Ethnicity: non-Hispanic	363	360		
Education: HS	43	38	0.02	0.81
Education: PSE	121	126		
Education: COL	223	223		
Current smoker: no	350	349	0.01	0.90
Current smoker: yes	37	38		
Hypertension history: yes	101	107	0.03	0.63
Hypertension history: no	286	280		
Heart disease history: yes	17	16	0.01	0.86
Heart disease history: no	370	371		
Diabetes mellitus history: yes	39	39	0.00	>0.99
Diabetes mellitus history: no	348	348		
Asthma history: yes	70	65	0.03	0.64
Asthma history: no	317	322		
PPR duration: <1 year	88	80	0.03	0.76
PPR duration: 1–5 years	150	157		
PPR duration: >5 years	149	150		

Sdiff, standardized mean difference; HS, high school diploma or lesser education; PSE, some post-secondary education; COL, college degree or greater education; PPR, patient-physician relationship. [a]Non-white races include American Indian or Alaskan Native, Asian, Black or African American, and Native Hawaiian or Other Pacific Islander.

Primary outcomes pertaining to physician communication and physician empathy

Overall, patients reported having physicians ranging from 0 to 100 on each CBQ scale. The mean (95 % confidence interval [CI]) scores were 73.7 (71.9–75.5) for patient participation and patient orientation, 74.3 (72.5–76.0) for effective and open communication, 78.4 (76.8–79.9) for emotionally supportive communication, and 62.4 (60.4–64.3) for communication about personal circumstances. Patients in the chronic pain group were treated by physicians having lower scores on each aspect of communication compared with patients in the control group (Figure 1). Moreover, all between-group differences were clinically relevant with d=0.35 for patient participation and patient orientation; d=0.39 for effective and open communication; d=0.43 for emotionally supportive communication; and d=0.31 for communication about personal circumstances. Overall scores for physician empathy ranged from 10 to 50, with a mean (95 % CI) of 40.3 (39.5–41.1). Patients in the chronic pain group were treated by physicians having lower empathy scores than those in the control group (Figure 2). The latter finding was also clinically relevant (d=0.27).



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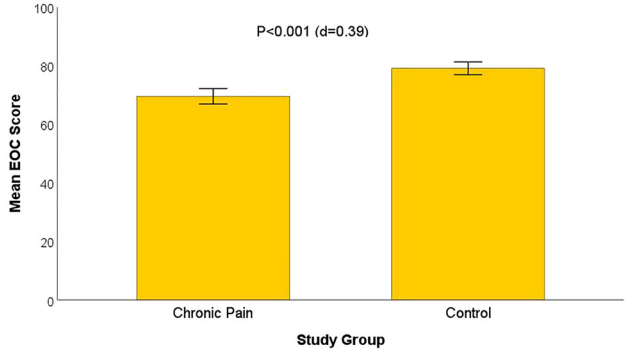

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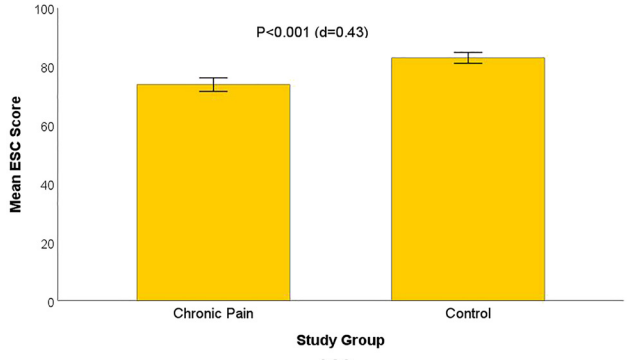

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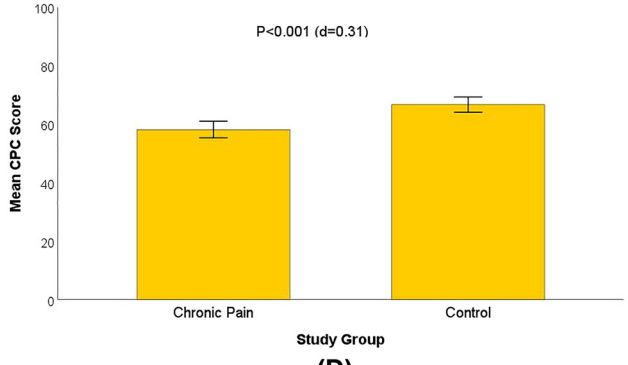

(D)

Figure 1: Physician communication by study group. (A) Patient participation and patient orientation, (B) Effective and open communication, (C) Emotionally supportive communication, and (D) Communication about personal circumstances were each measured with the Communication Behavior Questionnaire, with scores ranging from 0 to 100. Higher scores represent better physician communication on each measure. Error bars represent 95 % confidence intervals. CPC, communication about personal circumstances; EOC, effective and open communication; ESC, emotionally supportive communication; PPPO, patient participation and patient orientation.

Secondary exploratory analysis for association of physician communication and physician empathy with physician type

There were 96 (12.4 %) and 678 (87.6 %) patients treated by osteopathic and allopathic physicians, respectively. Although patients in the chronic pain group had physicians with lower scores on each aspect of communication and empathy than those in the control group (p<0.001 for each measure) in this analysis, there were no differences in physician communication or physician empathy among patients treated by osteopathic or allopathic physicians. Moreover, group X physician type interaction effects were not observed for physician communication (Figure 3) or empathy (Figure 4).

Discussion

Our study found that patients with chronic pain were treated by physicians who were rated more poorly on communication and empathy compared with physicians who treated chronic pain-free patients. The results, which were consistent across all four aspects of physician communication and physician empathy, were also clinically relevant (i.e., the magnitude of d-statistics ranged from 0.27 to 0.43). This underscores the challenges that patients and physicians may encounter during medical care for chronic pain management. The Centers for Disease Control and Prevention (CDC) guideline for prescribing opioids for pain was developed as a clinical tool to improve communication between patients and physicians and to empower them to make informed, patient-centered treatment decisions together [18]. The guideline recommends that physicians provide culturally and linguistically appropriate communication, including that which is accessible to persons with disabilities, and ensure access to an appropriate, affordable, diversified, coordinated, and effective nonpharmacologic and pharmacologic pain management regimen for all persons [18]. Shared decision-making is particularly important when treatment decisions involve initiating or continuing opioid therapy, and physicians should review the benefits and risks of opioid therapy with empathy [18]. Nevertheless, shared decision-making may be time-consuming and costly in busy

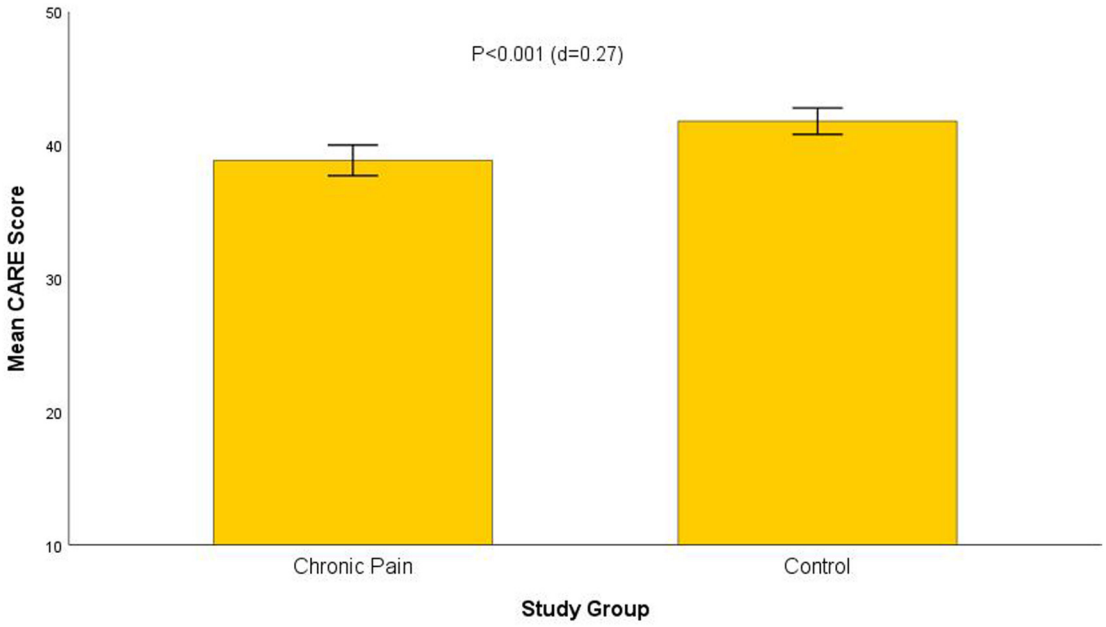

Figure 2: Physician empathy by study group. Physician empathy was measured with the Consultation and Relational Empathy (CARE) measure, with scores ranging from 10 to 50. Higher scores represent greater physician empathy. Error bars represent 95 % confidence intervals.

primary care settings [19], especially when such communication may be needed during ongoing medical encounters to assess pain outcomes and treatment options.

Physician empathy has been associated with better outcomes among patients with chronic pain [7]. A possible explanation is that patients with chronic pain may be more likely to discuss psychosocial issues with more empathic physicians, thereby focusing diagnosis and treatment in ways that enhance patient compliance and improve outcomes [20]. In addressing strategies to improve physician empathy for patients with chronic pain, questions arise about whether physician empathy is an innate trait, or if it can be learned and maintained during medical education and beyond. Most believe that it can be cultivated through life experiences to improve medical care [21]. Some propose that physicians consider empathy as emotional labor that involves managing experienced and displayed emotions to present a certain image [22]. In this model of empathy, patient and physician characteristics interact with empathic processes to yield patient outcomes pertaining to health status and satisfaction with medical care, and physician outcomes relating to job satisfaction or burnout. However, medical students often become less empathic during their education [23]. This is often attributed to a greater perceived need for patient detachment and reliance on technology. The challenges of contemporary medicine, including electronic medical records and time constraints, may also contribute to an erosion of empathy after medical students complete their education and training and enter the physician workforce [24].

Artificial intelligence (AI) may represent an opportunity to augment physician empathy. Utilizing AI to review 1.6 million narrative comments from patient surveys, empathy emerged as the predominant aspect of a physician's perceived courtesy and respect among all racial groups [25]. Such AI insights may be increasingly utilized to refine and enhance physician empathy to improve the quality and value of care among patients with chronic pain. Along these lines, research has demonstrated that responses from an AI chatbot assistant (ChatGPT) to patient questions posted to a social media forum were more empathic and of higher quality than physician responses [26]. Future research should address whether harnessing such AI, without disengaging the physician, may yield better patient outcomes while also improving physician job satisfaction and preventing burnout.

Previous research has shown that osteopathic physicians who treat patients with predominantly chronic pain display greater empathy than allopathic physicians who treat such patients [27]. Osteopathic physician empathy was also subsequently shown to be an important mediator of long-term outcomes among patients with chronic pain [28]. However, in this study that included both patients with and without chronic pain, greater empathy was not observed among osteopathic physicians compared with allopathic physicians. This suggests that osteopathic physician empathy is displayed more prominently during encounters involving chronic pain management than during those for general medical care. However, our

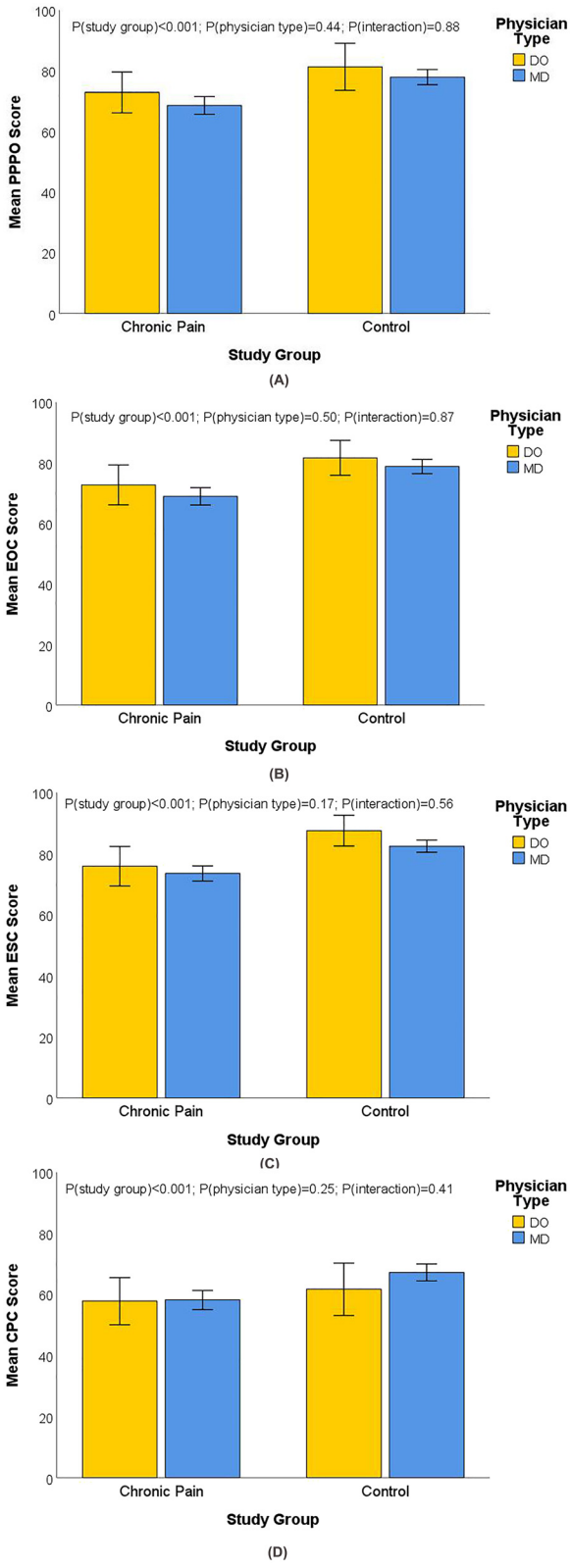

Figure 3: Physician communication by study group and physician type. (A) Patient participation and patient orientation, (B) Effective and open communication, (C) Emotionally supportive communication, and (D) Communication about personal circumstances were each measured with the Communication Behavior Questionnaire, with scores ranging from 0 to 100. Higher scores represent better physician communication on each measure. Error bars represent 95 % confidence intervals. CPC, communication about personal circumstances; DO, osteopathic physician; EOC, effective and open communication; ESC, emotionally supportive communication; MD, allopathic physician; PPPO, patient participation and patient orientation.

sample size was not sufficiently large to adequately test this hypothesis. Nevertheless, osteopathic physicians should strive to enhance their communications with, and to cultivate empathy for, all patients within their care utilizing osteopathic principles to foster a patient-centered approach.

There is evidence that the relationship between empathy and pain may be moderated by touch [29], although it is not known if this extends to patient-physician interactions involving such interventions as osteopathic manipulative treatment (OMT). Previous research appears to favor physician empathy over OMT as an explanation for better outcomes among patients with chronic pain treated by osteopathic physicians [28]. However, our study was not able to perform a direct comparison of osteopathic physician empathy and OMT because PRECISION does not collect data on manual therapies for chronic pain-free patients. The interaction of osteopathic physician empathy and touch, as a component of OMT, may be fertile ground for future research in chronic pain management.

In addition to the previously mentioned limitations pertaining to sample size, another shortcoming of our study was its cross-sectional design. This precluded a clear determination of the temporal relationship between chronic pain and physician communication and physician empathy. Thus, we cannot determine if treating patients with chronic pain makes physicians less communicative or less empathic over time, or whether having less communicative or less empathic physicians contributes to the development of chronic pain among patients. Additionally, we did not measure the association of pain or related outcomes with physician communication and physician empathy.

Nevertheless, our study had several strengths. First, patients with chronic low back pain selected from PRECISION were comparable to such patients throughout the United States with regard to age, sex, education, cigarette smoking, and medical comorbidities, as reported in the National Health and Nutrition Examination Survey [30]. Second, patients with chronic low back pain were matched to chronic pain-free patients on sociodemographic and clinical characteristics within a caliper width of 0.001 utilizing propensity scores. Consequently, the negligible

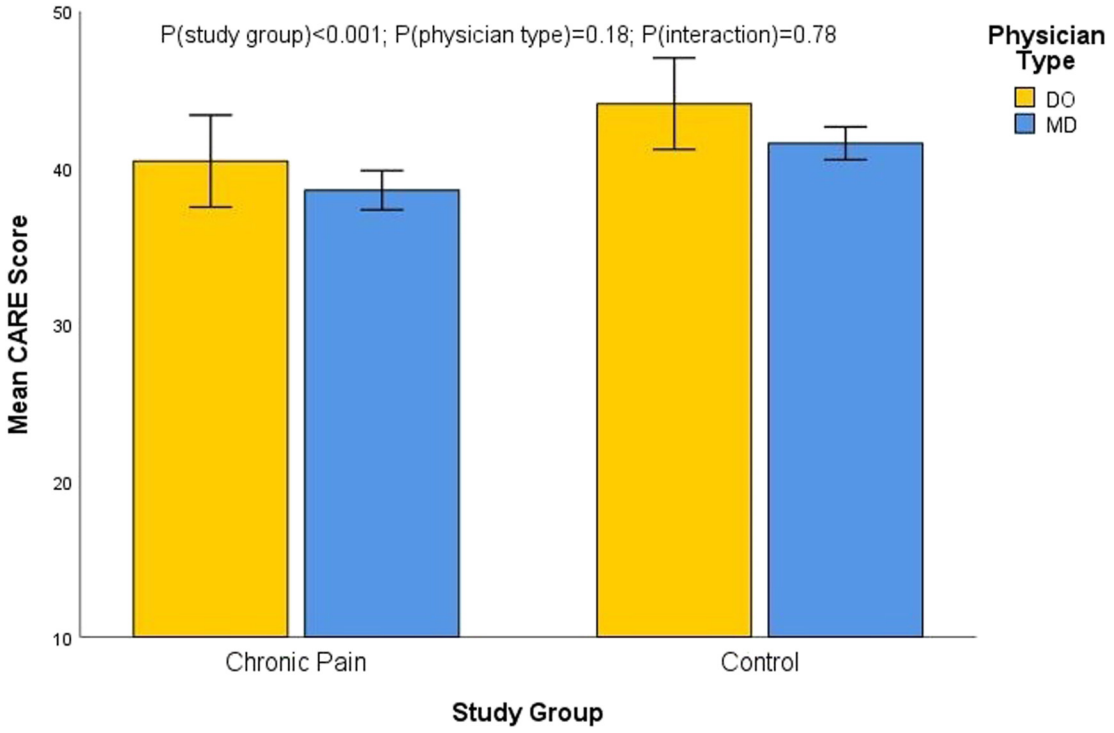

Figure 4: Physician empathy by study group and physician type. Physician empathy was measured with the Consultation and Relational Empathy (CARE) measure, with scores ranging from 10 to 50. Higher scores represent greater physician empathy. Error bars represent 95 % confidence intervals. DO, osteopathic physician; MD, allopathic physician.

differences between groups in these characteristics decreased the likelihood of residual confounding of study results. Third, physician communication and physician empathy were each measured utilizing research instruments that were validated in populations that included patients with both chronic pain and chronic medical conditions [10, 13]. Finally, physician communication and physician empathy were each rated by patients rather than being self-reported by physicians. Particularly with regard to empathy, most studies (including the least rigorous ones) utilize physician self-reported measures of empathy [31], which often measure physician attitudes about empathy rather than empathy itself [32].

Conclusions

Patients with chronic pain were treated by physicians having lower scores for physician communication and physician empathy than physicians who treated chronic pain-free controls. These differences were all clinically relevant, suggesting that chronic pain adversely affects the quality of the patient-physician relationship. Longitudinal research is needed to more clearly determine the temporal relationship between patient chronic pain and physician communication and physician empathy.

Research ethics: This research was approved by the North Texas Regional Institutional Review Board (protocol 2015-169).
Informed consent: All study participants signed a written informed consent form.
Author contributions: All authors have accepted responsibility for the entire content of this manuscript and approved its submission.
Use of large language models, AI and machine learning tools: Not applicable.
Research funding: None declared.
Conflict of interest: None declared.
Data availability: Data sharing is not available at this time because the study data belong to an existing registry that continues to use them to conduct ongoing research. Updates regarding the registry's future plans to share individual participant data may be posted to ClinicalTrials.gov.

References

1. Rikard SM, Strahan AE, Schmit KM, Guy GP Jr. Chronic pain among adults – United States, 2019-2021. MMWR Morb Mortal Wkly Rep 2023;72:379–85.
2. Smuck M, Barrette K, Martinez-Ith A, Sultana G, Zheng P. What does the patient with back pain want? A comparison of patient preferences and physician assumptions. Spine J 2022;22:207–13.

3. Buchman DZ, Ho A, Illes J. You present like a drug addict: patient and clinician perspectives on trust and trustworthiness in chronic pain management. Pain Med 2016;17:1394–406.
4. Haskard Zolnierek KB, DiMatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. Med Care 2009;47: 826–34.
5. Farin E, Gramm L, Schmidt E. The patient-physician relationship in patients with chronic low back pain as a predictor of outcomes after rehabilitation. J Behav Med 2013;36:246–58.
6. Cappola AR, Cohen KS. Strategies to improve medical communication. JAMA 2024;331:70–1.
7. Licciardone JC, Tran Y, Ngo K, Toledo D, Peddireddy N, Aryal S. Physician empathy and chronic pain outcomes. JAMA Netw Open 2024;7: e246026.
8. ClinicalTrials.gov. PRECISION pain research registry (PRECISION). https://clinicaltrials.gov/ct2/show/NCT04853732.
9. National Center for Health Statistics. NAMCS micro-data file documentation; 2010. https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/doc2010.pdf [Accessed 27 May 2024].
10. Farin E, Gramm L, Kosiol D. Development of a questionnaire to assess communication preferences of patients with chronic illness. Patient Educ Counsel 2011;82:81–8.
11. Farin E, Gramm L, Schmidt E. Taking into account patients' communication preferences: instrument development and results in chronic back pain patients. Patient Educ Counsel 2012;86: 41–8.
12. Mercer SW, Maxwell M, Heaney D, Watt GC. The Consultation and Relational Empathy (CARE) measure: development and preliminary validation and reliability of an empathy-based consultation process measure. Fam Pract 2004;21:699–705.
13. Mercer SW, McConnachie A, Maxwell M, Heaney D, Watt GC. Relevance and practical use of the Consultation and Relational Empathy (CARE) measure in general practice. Fam Pract 2005;22:328–34.
14. Haukoos JS, Lewis RJ. The propensity score. JAMA 2015;314:1637–8.
15. Faraone SV. Interpreting estimates of treatment effects: implications for managed care. P T 2008;33:700–11.
16. Dean AG, Sullivan KM, Soe MM. OpenEpi: open source epidemiologic statistics for public health. https://www.OpenEpi.com [Accessed 27 May 2024].
17. Sommet N, Weissman DL, Cheutin N, Elliot AJ. How many participants do I need to test an interaction? Conducting an appropriate power analysis and achieving sufficient power to detect an interaction. Adv Methods Pract Psychol Sci 2023;6:1–21.
18. Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. CDC clinical practice guideline for prescribing opioids for pain – United States, 2022. MMWR Recomm Rep (Morb Mortal Wkly Rep) 2022;71:1–95.
19. Coulter A. Partnerships with patients: the pros and cons of shared clinical decision-making. J Health Serv Res Policy 1997;2:112–21.
20. Zinn W. The empathic physician. Arch Intern Med 1993;153:306–12.
21. Zaki J. The caregiver's dilemma: in search of sustainable medical empathy. Lancet 2020;396:458–9.
22. Larson EB, Yao X. Clinical empathy as emotional labor in the patient-physician relationship. JAMA 2005;293:1100–6.
23. Hojat M, Mangione S, Nasca TJ, Rattner S, Erdmann JB, Gonnella JS, et al. An empirical study of decline in empathy in medical school. Med Educ 2004;38:934–41.
24. Ofri D. Empathy in the age of the electronic medical record. Lancet. 2019;394:822–3.
25. Guney S, Gandhi TK. Leveraging AI to understand care experiences: insights into physician communication across racial and ethnic groups. NEJM Catalyst 2022;3:1–9.
26. Ayers JW, Poliak A, Dredze M, Leas EC, Zhu Z, Kelley JB, et al. Comparing physician and artificial Intelligence chatbot responses to patient questions posted to a public social media forum. JAMA Intern Med 2023;183:589–96.
27. Licciardone JC, Schmitt ME, Aryal S. Osteopathic and allopathic physician interpersonal manner, empathy, and communication style and clinical status of their patients: a pain registry-based study. J Am Osteopath Assoc 2019;119:499–510.
28. Licciardone JC, Kellerlee J, Joseph M, Mohammad MB, Kim KG, Jain J, et al. The process and outcomes of chronic low back pain treatment provided by osteopathic and allopathic physicians: a retrospective cohort study. J Osteopath Med 2023;123:385–94.
29. Goldstein P, Shamay-Tsoory SG, Yellinek S, Weissman-Fogel I. Empathy predicts an experimental pain reduction during touch. J Pain 2016;17: 1049–57.
30. Shmagel A, Foley R, Ibrahim H. Epidemiology of chronic low back pain in US adults: data from the 2009–2010 National Health and Nutrition Examination Survey. Arthritis Care Res 2016;68:1688–94.
31. Kelm Z, Womer J, Walter JK, Feudtner C. Interventions to cultivate physician empathy: a systematic review. BMC Med Educ 2014;14:219.
32. Riess H. Empathy can be taught and learned with evidence-based education. Emerg Med J 2022;39:418–19.